

Freshman Seminar: Social Simulation
Carnegie Mellon University
Spring 2015

INSTRUCTORS Dr. Kevin Zollman
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DESCRIPTION Computer simulations have been used for almost as long as there have been computers. The earliest scientific use of computer simulations were for physics and engineering. Will this bridge hold up to strong winds? What is happening inside of a nuclear explosion? Etc.

Increasingly people are also employing computer simulation for use in understanding social behavior both in humans and other animals. How will people flee a fire? How will they react to an epidemic? How does the behavior of predators effect the dynamics of an evolving population? Etc.

This class is about the nuts and bolts of computer simulation of social behavior and about the underlying theory behind this work.

COURSE OBJECTIVES By the end of this class, you will be able to write your own computer simulation of social behavior using the programming tool *NetLogo*. In addition, you will be able to describe both the structure and results of your simulation.

Also by the end of this course, you should be able to think critically about simulations designed by others. You should be able to have developed thoughts about the appropriateness of a simulation for a given purpose.

READINGS Railsback and Grimm, *Agent-Based and Individual-Based Modeling*

Weisberg, *Simulation and Similarity*

GRADING Your grade will be calculated as follows:

Attendance and participation – 10%
Two in class presentations – 10% each
Two peer evaluations – 5% each
Two mid project reports – 10% each
Final presentation – 20 %
Final report – 20%

You are allowed three absences throughout the semester without any need for an explanation. If you are absent more than that you *must* excuse **all** absences in order not to lose points. Plan accordingly.

ASSIGNMENTS Over the semester, you will develop a computer simulation of social behavior on a topic of your choice. Along the way you will give a number of class presentations and get feedback from us.

MISCONDUCT AND PLAGIARISM Plagiarism and other forms of academic misconduct will not be tolerated. If you commit an act of plagiarism or academic misconduct you will fail the course and will be reported to central administration. Are you unsure about what is plagiarism or academic misconduct? Read the university policy and look at plagiarism.org.

LATE WORK If you are having trouble finishing the work on time contact me *more than 24 hours* before the assignment is due and we can discuss arrangements and penalties for late work. Unless serious misfortune befell you, I will not accept late work if you don't approach me before that deadline and you will receive a zero.

Date	Topic
Jan 13	Introduction – Hipsters and Racists
Jan 15	Modeling day <i>Before class:</i> Read Railsback and Grimm, Chapter 1 <i>In class:</i> Work through Railsback and Grimm, Chapter 2
Jan 20	Modeling day <i>Before class:</i> Read Railsback and Grimm, Chapter 3 <i>In class:</i> Work through Railsback and Grimm, Chapter 4
Jan 22	Modeling day – Zollman out of town <i>In class:</i> Work through Railsback and Grimm, Chapter 5
Jan 26	Philosophy day <i>Before class:</i> Read Weisberg, Chapters 1 and 2, and have answers to reading questions <i>In class:</i> Discuss Weisberg, Chapters 1 and 2
Jan 29	Modeling day <i>In class:</i> Work through Railsback and Grimm, Chapter 6
Feb 3	Philosophy day <i>Before class:</i> Read Weisberg Chapter 3 <i>In class:</i> Discuss Weisberg Chapter 3
Feb 5	Modeling day <i>Before class:</i> Read Railsback and Grimm Chapter 7 <i>In class:</i> Work through Railsback and Grimm Chapter 8
Feb 10	Modeling day <i>In class:</i> Work through Railsback and Grimm Chapter 9
Feb 12	Philosophy day <i>Before class:</i> Read Weisberg Chapter 4 <i>In class:</i> Discuss Weisberg Chapter 4
Feb 17	In class presentations – Zollman out of town <i>Before class:</i> Prepare a short presentation for your peers to introduce the phenomenon you want to model <i>In class:</i> Present the phenomenon to peers and provide feedback for others
Feb 19	Modeling day – Zollman out of town <i>In class:</i> Work through Railsback and Grimm, Chapter 10
Feb 24	Philosophy day <i>Due Today:</i> Description of phenomenon to be modeled <i>Before class:</i> Read Weisberg Chapter 5 <i>In class:</i> Discuss Weisberg Chapter 5
Feb 26	Modeling day <i>In class:</i> Work through Railsback and Grimm, Chapter 11
Mar 3	Philosophy day <i>Before class:</i> Read Weisberg, Chapter 6 <i>In class:</i> Discuss Weisberg, Chapter 6

Date	Topic
Mar 5	Modeling day <i>In class:</i> Work through Railsbach and Grimm, Chapter 12
Mar 17	Philosophy day <i>Before class:</i> Read Weisberg, Chapter 7 <i>In class:</i> Discuss Weisberg, Chapter 7
Mar 19	Modeling day <i>In class:</i> Work through Railsbach and Grimm Chapter 13
Mar 24	Philosophy day <i>Before class:</i> Read Weisberg, Chapter 8 <i>In class:</i> Discuss Weisberg, Chapter 8
Mar 26	Modeling day <i>In class:</i> Work through Railsbach and Grimm, Chapter 14
Mar 31	In class presentations <i>Before class:</i> Prepare a short presentation for your peers to introduce the basics of the model <i>In class:</i> Present the model to peers and provide feedback for others
Apr 2	Philosophy day <i>Before class:</i> Read Weisberg Chapters 9 and 10 <i>In class:</i> Discuss Weisberg Chapters 9 and 10
Apr 7	Modeling day <i>Due today:</i> Description of the model <i>In class:</i> Work through Railsbach and Grimm, Chapter 15
Apr 9	Modeling day <i>In class:</i> Work through Railsbach and Grimm, Chapter 16
Apr 14	Modeling day <i>In class:</i> Work on your model
Apr 21	Modeling day <i>In class:</i> Work on your model
Apr 23	Modeling day <i>In class:</i> Work on your model
Apr 28	In class presentations <i>Before class:</i> Prepare a short presentation for your peers to describe your model results <i>In class:</i> Present the model to peers and provide feedback for others
Apr 30	In class presentations <i>Before class:</i> Prepare a presentation for the entire class about your model <i>In class:</i> Present the model to the class
Final day	In class presentations <i>Due Today:</i> Written description of the phenomenon, model, and results <i>Before class:</i> Prepare a presentation for the entire class about your model <i>In class:</i> Present the model to the class